

TAXONOMIC NOTES ON NEW TAXA OF *CLITORIA JAVITENSIS* (LEGUMINOSAE) AND THE EXCLUSION OF VAR. *GLABRA* SAGOT¹

PAUL R. FANTZ

*Dept. of Horticultural Science, Box 5216
North Carolina State University, Raleigh, NC 27650*

In preparation for a monographic treatment of the genus *Clitoria*, I have examined and annotated nearly eight thousand herbarium sheets. A major problematic group is the widespread neotropical complex which bears the name *Clitoria javitensis* Benth.

Clitoria javitensis (HBK) Benth. is a widespread neotropical species placed in subgenus *Bractearia* (Mart. ex Benth.) Fantz section *Cauliflorae* Fantz. Members of section *Cauliflorae* are characterized as lianas or occasionally erect shrubs bearing inflorescences that are racemose, nodose, axillary and cauliflorous; bracteoles that are narrow and usually shorter than the calyx; and legumes that are flat and contained suborbicular, thickened seeds (Fantz, 1979).

Historically botanists have misidentified numerous specimens of the species in section *Cauliflorae*. Frequent citation of these specimens in floristic treatments has resulted in nomenclatural confusion. These mistakes were compounded by later botanists utilizing these earlier works. Floristic treatment of any species of liana in the genus *Clitoria* must be accepted cautiously. The range of the given species may not fall within the geographical boundaries of the flora. The taxonomic description may not agree with the named used, or may be a "hybrid" description of two or more species. Furthermore, specimens cited may not belong to the name of the species used.

Three names commonly are used for this group of species. First, the name *Clitoria arborescens* Ait. (it correctly should be *C. arborescens* R. Brown in Ait.) was applied to any woody climber that lacked the broad bracteoles that are subequal to the calyx, and often obscure it. The name *C. arborescens* was the earliest name available for a species of liana. Therefore, it has been misapplied repeatedly to a large number of collections. The species has been reported from a number of countries in which it is now known to be outside of its range. Second, the name *C. javitensis* became more popular after Bentham (1858) noted that *C. arborescens* had leaves

¹ Paper No. 6942 of the Journal Series of the North Carolina Agricultural Research Service, Raleigh, NC.

that were tomentose below, whereas *C. javitensis* had leaves that were glabrate, with scattered appressed trichomes below. Third, the name *Clitoria leptostachya* Benth. was applied to any species of liana with an elongated inflorescence.

Clitoria javitensis is easily recognized from all other members of section *Cauliflorae* by its large fruits (18–24 cm long x 1.8–2.5 cm wide), bearing a dense pubescence of appressed to suberect, rufous trichomes, lacking the uncinata trichomes found on the fruits and calices of other species, and the elongated claw of the vexillum (18–27 mm). This species is native from the western Amazon Basin north into Central America, including Peru, Columbia, western Brazil and Venezuela, and Panama.

Clitoria arborescens is distinguished from *C. javitensis* by smaller flowers (4–6 cm) with a shorter calyx tube (12–17 mm) and longer bracteoles (10–15 mm), leaves tomentose below, and a shorter stipitate-legume (stipe 14–20 mm). This species is native from French Guiana to eastern Venezuela, with an occasional isolated collection from Colombia or northern Venezuela. This species has been cultivated, and the isolated collections may have represented this introduction.

Clitoria leptostachya is distinguished from *C. javitensis* by a narrower and shorter legume (13–18 cm long x 1.2–5 cm wide), a calyx conspicuously uncinata-pubescent (vidi 20-30X) with few subappressed macrotrichomes, a smaller flower (4.5–6 cm) with a style longer than the ovary, and bearing elongate inflorescences (10–70 cm). This species is native to forests of Guyana and eastern Amazonas to western Pará, Brazil.

HISTORY OF CLITORIA JAVITENSIS

The species was originally described under the name *Neurocarpum javitense* HBK in 1824. The description of the species was detailed, and included vegetative and floral structures. Fruits were not observed. One collection was cited as "credit in ripa fluminis Tuamini, prope Javitam (Misiones del Rio Negro)" without collectors noted. The type specimen was collected by *Humbolt & Bonpland* near Yavita in Amazonas, Venezuela, and is deposited at Paris (P).

Bentham (1858) revised the genus *Clitoria*, including *Neurocarpum* in synonymy. He transferred the species *Neurocarpum javitense* to *Clitoria*, citing several additional specimens, which when examined, would broaden the concept of the species. These specimens were *Spruce* 1877 and 2320 from northern Brazil, and *Rob. Schomburgk* 1000 and *Rich. Schomburgk* 1723 of British Guiana.

Sagot (1882) described a new variety, *C. javitensis* var. *glabra*, based upon his collection, *Sagot* 120, from French Guiana.

In the mid 1920's, N. E. Brown annotated several of the Kew sheets from Bentham's herbarium and concluded (as indicated by his annotations on these sheets) that most of the specimens cited by Bentham were distinct

from each other. He referred to them as distinct species, but never gave them a name. No record of any publication by Brown of his observations has been found.

Sandwith (1931) summarized his observations of the leaves, calyx, and bracteoles of the type of *C. javitensis* (P), making comparisons with the specimens in Bentham's herbarium. He selected *Spruce s.n.*, Hb. Bentham and Hb. Hooker, San Carlos, Venezuela, 1853, as the one specimen which best agrees with the type at Paris. He noted that *Spruce* 2320 has material from two different collections mounted on the same sheet. He further noted that *Ducke* 23406 agreed well with *Spruce* 1877 which was observed to have longer bracteoles and calyx teeth. Sandwith concluded that *C. javitensis* was highly variable in length and position of the bracteoles, in the size of the calyx, corolla, and leaves, and in the leaf pubescence. Sandwith recognized two basic groups, which he treated as varieties. The typical variety included *Humboldt & Bonpland* (type), *Spruce* 1877, *Ducke* 23406, and *Spruce* 2320 (in part). His second group was *C. javitensis* var. *glabra* Sagot, which included *Sagot* 120 (type), *Schomburgk* 1000, *Schomburgk* 1723, and *Spruce* 2320 (in part), plus the additional collections: British Guiana—*Hitchcock* 17309, *Gleason* 543 and 713, *Jenman* 4930 and 2498, *Sandwith* 599; Venezuela—*Spruce* 3543.

Specimens I examined and annotated: *Spruce s.n.*, San Carlos, 1853 (K-Hb. Bentham), *Spruce* 1877 (K-Hb. Bentham), *Spruce* 2320 (K), *Spruce* 3543 (CGE, G, GH, F, K, RB, W), *Schomburgk* 1000 (BM, CGE, W), *Schomburgk* 1000/1723 (K), *Sagot* 120 (GH, K, NY, S, U, W), *Ducke* 23406 (G, K, RB, S, US), *Hitchcock* 17309 (GH, NY, S, US), *Gleason* 543 (GH, NY) and 714 (GH, NY), *Jenman* 4930 (K), and *Sandwith* 599 (K, NY, RB).

Based upon the identifications of uncited specimens which I have examined, it is apparent that most botanists have accepted Sandwith's treatment.

The type specimen of *C. javitensis* has not been seen by this author as it was not included in the loan from Paris. An attempt was made in 1975 to obtain this particular specimen, or a photograph of it, but the specimen could not be located at the Herbarium of the Museum d'Histoire Naturelle (P). I have obtained a concept of the type of *C. javitensis* from three main sources. First, the original description by Humbolt, Bonpland, and Kunth (1824) was very detailed. Second, Sandwith (1931) noted that *Spruce s.n.*, San Carlos, Venezuela, Aug 1853 (K!) was the best match to the Paris type. In addition, *Spruce* 2320 (K!) bears his annotation notes which indicate that the indumentum of the calyx and vexillum, bracteoles size, and general appearance of the calyx "agree well with those of the type of *C. javitensis* at Paris." Since this specimen contains mixed material, it should be noted that Sandwith's annotations refer to the specimen mounted on the left side of the herbarium sheet. Third, I have examined numerous specimens labeled *C. javitensis* near the type locality.

REVISED CONCEPT OF CLITORIA JAVITENSIS

Based upon the evidence examined during this study, I reject the broad concept of *C. javitensis* as viewed by Sandwith, agreeing more closely with the conclusions of N. E. Brown. Sandwith's concept of *C. javitensis* contained a mixture of morphologically variable plants that can be segregated into distinct groups by both morphological characters and geographical distribution. The concept of *C. javitensis* in this treatment has been emended to exclude *C. javitensis* var. *glabra* Sagot. In addition, two new names, *Clitoria portobellensis* Beurl. and *Clitoria grandifolia* Ducke, have been placed in synonymy.

Most of the specimens cited by Sandwith, as well as the type of *C. javitensis* var. *glabra* Sagot belong to a species described in *Clitoria sagotii* Fantz, SIDA, Contr. Bot. 8(1):9. 1979. The use of Sagot's epithet as the specific epithet was rejected because of probable confusion with *Clitoria glaberrima* Pitt. found in the same subgenus. *Clitoria sagotii* is easily distinguished from *C. javitensis* by the raised midrib on the upper leaf surface, the uncinat pubescence of the calyx, vexillum, and legume, the smaller flowers, and the subsessile inflorescences. A morphological comparison between *C. javitensis* and *C. sagotii* (synonym: *C. javitensis* var. *glabra* Sagot) is provided in Table 1. *Clitoria sagotii* includes the cited specimens of Sagot 120, Schomburgk 1000, Schomburgk 1000/1723, Gleason 543 and 714, Hitchcock 17309, Jenman 4930, Sandwith 599, Spruce 3543, and Spruce 2320-B. Spruce 2320 is a mixed collection separated on the herbarium sheet by pencil lines, and annotated with notes in pencil by Brown and Sandwith. The branch bearing leaves mounted on the left side of the sheet, the branch bearing flowers mounted on the right side of the sheet, and the packet of loose flowers were labeled "A" by Fantz, and represent *C. javitensis*. The branch bearing leaves in the center of the sheet plus the individual mounted flower were labeled "B" by Fantz, and represent *C. sagotii*. Spruce 1877 and Ducke 23406 represent another new species which will be described in a succeeding paper.

The revised concept of *C. javitensis* is described as follows:

CLITORIA JAVITENSIS (H.B.K.) Benth., Journ. Linn. Soc. 2:42. 1858. *emend.* Fantz (TYPE: prope Javitam, Missiones del Rio Negro, Humbolt & Bonpland s.n., P).

Neurocarpum javitense H.B.K., Nov Gen. Sp. 6:409. 1823. (TYPE: Javitam, Humbolt & Bonpland s.n., P).

Clitoria grandifolia Ducke, Arch. Jard. Bot. Rio de Jan. 5:141. 1930. (LECTOTYPE: Ducke 20399, RB).

Clitoria portobellensis Beurl., Kingl Vetenskaps Acad. Handl. p. 119, 1854. (LECTOTYPE: Porto-Bello, 1826, Billberg s.n., S-hb. Regnell).

Ternatea javitensis (H.B.K.) Kuntze, Rev. Gen. Pl. 1:210. 1891. (TYPE: Javitam, Humbolt & Bonpland s.n., P).

Table 1. A comparison of some vegetative and reproductive differences of
C. javitensis (HBK) Benth. and *C. sagotii* Fantz

CHARACTER	<i>C. JAVITENSIS</i>	<i>C. SAGOTII</i>
LEAVES:		
midrib above*	Impressed	Raised
INFLORESCENCE:		
length*	1–6 cm (occ. to 20 cm)	Subsessile to 0.5 cm
pubescence*	rufo-strigose	predominately uncinata
CALYX:		
tube*	17–24 mm	11–16 mm
lobes	4–8 mm	5–8 or 8–13 mm
pubescence*	appressed	uncinate predominately
BRACTEOLAS:		
length	2–3 mm or 4–6 mm	4–7 mm or 8–11 mm
insertion	1–2 mm (occ. 2–5 mm)	2–5 mm
VEXILLUM:		
claw*	15–19 mm	6–9 mm
pubescence*	tawny-rufo, appressed	uncinate, few appressed
ALAE:		
beyond carina	8–10 mm	8–13 mm
blade length*	24–30 mm	17–21 mm
CARINA:		
shape*	falcate	nearly straight
claw*	30–38 mm	25–32 mm
FLOWER SIZE:	(5.5) 6–8 mm	5–6 cm (occ. 6–8 cm)
ANDROECIUM:		
tube	(34) 38–49 mm	32–39 mm
free filaments	2–5 mm	4–7 mm
connective*	acute	apiculate
GYNOECIUM:		
ovary length*	17–22 mm	10–14 mm
ovary width*	1.5–1.8 mm	1–1.2 mm
ovary pubescence*	rufus to tawny	white tinged yellow
LEGUME:		
length*	18–24 cm	9–15 cm
width*	18–24 mm	15–18 mm
pubescence*	dense rufo-appressed	uncinate + scattered pilose
stipe	24–33 mm	30–37 mm
dehiscence*	$\frac{1}{4}$ to $\frac{1}{2}$ twist	1–2 twist
SEEDS:		
length*	9–12 mm	6–7 mm
width*	9–10 mm	7–8 mm
thickness	3–4 mm	5 mm
seeds per pod	7–11	4–8

* major difference

Note: Measurements separated by “or” indicate variation at subspecific levels.

Liana, tall, climbing to treetops, or less commonly an erect shrub, 2–4 m tall, polymorphic. Branches 3–9 mm thick, hollow, longitudinally striate to sulcate, terete, juvenile branch pubescence both uncinata and short, rufus, pilose, becoming glabrate; bark dark brown, peeling in longitudinal strips exposing lighter layers beneath. *Leaves* 3-foliate, coriaceous; leaflets variable in shape, size, and pubescence, mainly narrow to broadly elliptic-oblong, occasionally elliptic, lanceolate-elliptic, lanceolate-ovate, ovate, or oval, apex acuminate from an acute to obtuse lamina, acumen 1–3 cm, more or less mucronate, base broadly cuneate to rotund, midrib impressed above, often more or less short pilose, rarely pilose on primary nerves, primary nerves of 9–13 (15) pair, upper surface green to dark green, glabrous, lower surface green, pubescence typically appressed, short, slightly conspicuous, becoming glabrate to glabrous, or occasionally pilose becoming glabrate with the spreading trichomes confined to nerves, lamina 7–18 (23–28) cm long, 3–9 (18) cm wide. Petiole subterete, longitudinally striated to canaliculate, often gradually twisted, 4–17 (25) cm, pubescence uncinata and with rufus, appressed to suberect trichomes, becoming glabrate, rachis 1–4.5 cm. Petiolules subquadrate, 4–9 (10) mm, pubescence uncinata and pilose, rufus. Stipules deciduous, ovate to lanceolate, acute, 3–8 (10) mm long, 1–3 mm wide, pubescence uncinata and appressed, densest towards apex and more or less ciliate; stipels semipersistent, linear to subulate, acute, lateral stipels typically 3–7 mm long, 1–1.5 mm wide, terminal stipels 1–3 (4) mm long, 0.5–1 mm wide. *Inflorescences* axillary, solitary, and cauliflorous, solitary to few-fascicled, several to multi-flowered, racemose, nodose; axes pubescence dense, short-pilose, more or less rufus, axes typically (0.5) 1–5 cm long, occasionally more elongate, 4–18 cm long. Pedicels 4–9 mm, thickened to 3–4 mm in fruit. Bracts ovate, acute to acuminate, spreading to reflexed in age, pubescence uncinata and appressed; middle pair and outer bract persistent, 2–6 mm long, 1–3 mm wide. Bracteoles minute to short, ovate to lanceolate, broadly acute to short-acuminate, 2–6 mm long, 1–3 (4) mm wide, inserted 1–2 mm below calyx base or occasionally subopposite to alternately inserted, 2–5 mm below the calyx, pubescence appressed, more or less ciliate. *Flowers* resupinate, papilionaceous, large, showy, (5.5) 6–8 cm, various shades of pink to rose, less commonly lilac or lavender to pale violet; veins of vexillum dark pink to red or purplish within; alae and carinas whitish to pale pink to rose. Calyx tinged purple, pubescence appressed, uncinata trichomes lacking, tube (15) 17–24 mm long, 5–10 mm wide at base to 8–13 mm wide at throat, lobes broadly deltoid to ovate, acute to short acuminate, 4–8 mm long, 3–4 mm wide at base, ventral lobe subequal, 5–9 mm long, 1–1.5 mm wide. Vexillum pubescence moderate to dense, appressed, rufus becoming tawny, blade 3.5–5 cm wide, claw 15–19 mm. Alae extended beyond carina 7–10 mm, blade 22–31 mm long, 7–12 mm wide, claw 18–27 mm, uncinata pubescent. Carina falcate, blade 11–18 mm long, 3–6 mm wide, claw 30–38 mm. Staminal tube glabrous, (34) 38–49 mm long, free

filaments 2–5 mm; anthers lanceolate, 1.8–2 mm long, 0.5–0.8 mm wide. Gynophore 5–7 mm, pubescence dense, tawny-rufus; ovary 17–22 mm long, 1.5–1.8 mm wide, pubescence dense, appressed, rufus to tawny; style 16–25 (28) mm long, geniculate 6–9 mm from distal end, pubescence uncinata and densely bearded; stigma subcapitate, ca 0.7–0.9 mm wide. *Legume* long-stipitate, exerted beyond the calyx, flat, green to brown tinged reddish, pendant, weakly raised around seeds, pubescence dense, appressed to sub-erect, rufus, becoming thinned with age; valves 18–24 cm long, 18–25 mm wide; beak when present typically 3–7 mm; dehiscence causing valve to twist one-quarter to one-half of a turn; stipe 2–3 mm thick, (19) 24–37 mm long, pubescence uncinata and stigose to pilose, rufus. Seeds smooth, thick-lenticular, face suborbicular to slightly longer than wide, dark brown to black, 9–12 mm long, 9–10 mm wide, 3–4 mm thick, 7–11 seeds per pod; hilum 2 mm x 1 mm.

Clitoria javitensis is a polymorphic species which exhibits a range of variation in its habit, bracteole insertion below the calyx, and in the size of the leaflets, stipules, petioles, inflorescence, bracts, bracteoles, and calyx lobes. This complex needs further study incorporating field studies and experimental methods. From a morphological viewpoint, certain combinations of characters consistently are found to occur in plants from defined geographic areas. These distinct groups are treated nomenclaturally. They are easily recognized and segregated in a key. Comments on the variation that was observed for each structure will be noted first, followed by comments on combinations of characters which can be found in a geographic region.

The habit of the species is usually reported as a woody vine or liana. Occasionally, the species is an erect shrub 2–4 m tall, or a scandent shrub. Johnston (1949) expanded on the habit of individuals on San Jose Island noting that plants were woody vines in dense forests and erect shrubs in thickets and in more open areas.

The leaves and associated structures are highly variable. Generally, they can be divided into two distinct groups, the "typical leaf" (those which match the type specimen) and the "grandifoliate leaf". The typical leaf is short-petiolate with a short petiolule and smaller sized leaflets. The petiole is usually 4–12 cm long, sometimes elongating to 13–15 cm on larger leaflets. The petiolules are usually 4–6 mm long to rarely 7–8 mm on larger leaflets. The typical leaflet is elliptic to elliptic-oblong or lanceolate-elliptic, 7–18 cm long by 3–7 (9) cm wide. The grandifoliate leaf is long-petiolate, has a longer petiolule, and a larger size leaflet. The petiole is usually 10–20 (25) cm long, even on younger leaves. The petiolule is usually (6) 7–10 mm. The grandifoliate leaflet is usually ovate, ovate-elliptic, to lanceolate-ovate, becoming very broad, 15–28 cm long by 6–15 cm broad. The typical leaf is associated with shorter inflorescences, whereas the grandifoliate leaf is often found on individuals with elongate inflorescences. Exceptions do

occur, particularly in Meta, Colombia and parts of Amazonas, Venezuela where a typical leaf is associated with inflorescences of 6–8 cm, slightly larger than most specimens bearing typical leaves. Occasionally, a collected specimen with mostly typical leaves will exhibit one or two grandifoliate leaves (e.g., Panama). Thus, the leaf type is helpful as a supportive character, but not reliable as the only diagnostic character.

Stipules of individuals found in Central America and much of South America are generally 6–10 mm long. In Amazonas, Venezuela and adjacent areas, the stipules are consistently 3–5 mm long, rarely with a stipule reaching 6 mm. Stipules are deciduous, and not observed on all specimens.

The most common inflorescence is short, (0.5) 1–6 cm long, and few-flowered. Rarely an individual possessed an inflorescence which reached 8 cm long, although inflorescences to 10 cm long were observed in cultivated specimens. The less common inflorescence type was elongated, typically 4–18 cm long, with many flowers. Most collections from Meta, Columbia were intermediate, 4–7 cm long. Pedicels can be used as a supportive character. The short inflorescence type has pedicels commonly 3–7 mm, whereas some individuals may have longer pedicels. The long inflorescence type has pedicels of 6–11 mm.

Bracts are typically minute, 2–3 (4) mm long in South American members. Bracts of members in Central America and adjacent Colombia are commonly 4–6 mm. The bract length refers specifically to the middle pair of bracts which tend to be persistent, are usually the largest, and are concave and subtending the pedicel.

Bracteoles are commonly 4–7 mm long. Specimens from Amazonas, Venezuela and adjacent areas have minute bracteoles, typically 2–3 (4) mm long. In addition, these minute bracteoles are inserted 2–5 mm below the base of the calyx, whereas, most bracteoles are inserted only 1–2 mm below and subtend the base of the calyx.

Calyx lobes are commonly 4–6 mm long, broadly deltoid with the length subequaling the width or to 1.5 x the width at the base of the lobe. The apex is acute or sometimes short-acuminate. In Peru and the western Amazon Basin, the calyx lobes are elongate, the length nearly twice the width, with an acuminate to subulate apex.

The common stipe is 19–37 mm. Specimens with elongated inflorescences bear stipes of 19–24 mm, whereas, those of Central America and adjacent Colombia with shorter inflorescences bear stipes of 24–32 mm and those of other regions of South America with shorter inflorescences bear stipes of 28–37 mm.

A comparison of the patterns of variation and combinations of characters that are associated together suggest four distinct groups, which are treated as varieties. These varieties are summarized in Table 2.

The typical variety, var. *javitensis*, includes the type from Yavita, Venezuela. This group is easily recognized by the minute bracteoles inserted

Table 2. A taxonomic comparison between the varieties of *Clitoria javitensis*.

CHARACTER	JAVITENSIS	PORTOBELLENSIS	LONGILOBA	GRANDIFOLIA
INFLORESCENCE	Short	Short	Short	Long
LEAF TYPE	Typical	Typical	Typical	Grandifoliate
PETIOLE	Short	Short	Short	Long
PETIOLULE	Short	Short	Short	Long
STIPULE	Short	Long	Long	Long
BRACTS	Short	Long	Short	Short
BRACTEOLE				
LENGTH	Short	Long	Medium	Long
BRACTEOLE	Subtend or	Subtend	Subtend	Subtend
INSERTION	Below 2–5 mm			Below 2–5 mm
CALYX LOBES	Short	Short	Long	Long
STIPE	Long	Medium	Unknown	Short

Table 3. A key providing measurements for terms utilized in Table 2.

	<i>Short</i>	<i>Long</i>
Inflorescence	(0.5) 1–6 cm	6–18 cm
Petiole	4–10 (14) cm	10–20 (25) cm
Petiolule	4–6 (8) mm	6–10 mm
Stipule	3–5 mm	6–10 mm
Bracts	2–4 mm	4–6 mm
Bracteoles	2–4 mm	4–7 mm
Calyx lobes	4–6 (7) mm	(5) 6–9 mm
Stipe	19–24 mm	28–37 mm
LEAF KEY:	<i>Typical</i>	<i>Grandifoliate</i>
Leaflet length	7–18 cm	15–28 cm
Leaflet width	3–7 (9) cm	6–15 cm
Basic leaflet shape	Oblong-elliptic	Ovate

well below the calyx, and the short stipules. The inflorescence is short with flowers bearing short calyx lobes. Fruits are long-stipitate. The leaves are of the typical type. Within this variety are a number of plants with a consistently longer bracteole (by 1 mm) which is inserted 1–2 mm below the base of the calyx and subtending it. This group is treated as a form, *C. javitensis* var. *javitensis* f. *bracteosubtenda*. The typical variety is distributed in the central and western Amazon Basin, which includes southern Venezuela and Colombia, and Amazonas, Brazil.

A second variety is easily recognized by its elongate bracts. In addition, the stipules and bracteoles are longer than those in the typical variety, whereas the stipe is shorter. Specimens with this combination of characters are found only from Central America to Antioquia, Colombia. This group includes the type specimen for *Clitoria portobellensis* Beurl. Since most characters of *C. portobellensis* agree with those of *C. javitensis*, *C. portobellensis* Beurl. is synonymized with *C. javitensis*, and reduced from the level of species to the varietal level as *C. javitensis* var. *portobellensis* (Beurl.) Fantz, a new combination. Leaves of this variety typically are appressed pubescent below as in the typical variety. However, specimens frequently appear which are pilose below, an uncommon pubescent type for the species. These are treated as *f. pilosa*. There also occurs a rare leaflet shape in this group in which the apex is truncate, an apex type which is unknown elsewhere in the subgenus. It rarely occurs in other species, *Clitoria kaessneri* of Africa (subgenus *Clitoria*) and *Clitoria javanica* of Southeast Asia (subgenus *Neurocarpum*). It is treated as *f. truncata*.

A third variety is found only in Peru where the leaves are of the typical shape and the inflorescence is short, but the calyx lobes are conspicuously elongated and subulate. In addition, the stipules and bracteoles are longer than the typical variety. This group is treated as var. *longiloba*.

The last variety is easily recognized by its grandifoliate leaf and elongated inflorescences. In addition, the calyx lobes, stipules, and bracteoles are longer than the typical variety, whereas the stipe is shorter. This group includes the type specimens of *Clitoria grandifolia* Ducke (*Ducke* 20399, RB!, *Ducke* 20400, RB! S! U!, *Kuhlman* 1493, RB! U!). Nearly all the floral characteristics and those of the fruit, except for the stipe, agree with *C. javitensis*. Therefore, *Clitoria grandifolia* Ducke is synonymized with *C. javitensis* and reduced from the level of species to the varietal level as *C. javitensis* var. *grandifolia* (Ducke) Fantz.

NEW TAXA OF CLITORIA JAVITENSIS

1. CLITORIA JAVITENSIS (HBK) Benth. var. JAVITENSIS

Leaflets typically small, 7–18 cm long, 3–7 (9) cm wide. Petiole 4–10 (14) cm. Petiolule 4–6, rarely to 8 mm long. Stipules 3–5 mm. Inflorescences few-flowered, (0.5) 1–6 cm, rarely to 8 cm. Pedicels 3–7 (9) mm. Bracts 2–4 mm. Bracteoles 2–4. Calyx lobes 4–6 (7) mm, length subequal to 1.5 x width, apex acute to short-acuminate. Stipe 28–37 mm.

TYPE: VENEZUELA. AMAZONAS: crescit in ripa fluminis Tuamini, prope Javitam [=Yavita], Misiones del Rio Negro, *Humbolt & Bonpland s.n.* (P).

1a. *f. javitensis*

Bracteoles minute, 2–3 mm long, rarely 4 mm, subopposite becoming alternate on the pedicels, inserted 2–5 mm below the base of the calyx, or more or less reaching it.

1b. f. *bracteosubtenda* Fantz, f. nov.

Forma nova C. javitensis var. javitensis optimo distinguitur a bracteolis brevior fundo calycis insertis et pedicello sub-oppositis. Bracteolae (2) 3–4 (5) mm longae, calycis subtenda ad 2 mm infra fundo calycis inserta, apex plus minusve ad baso calycis partis strumosi.

TYPE: VENEZUELA. BOLÍVAR: Río Parguaza, between mouth of El Carmen, 50 km upstream, 80–110 m, 3 Jan 1956, Wurdack and Monachino 41093 (HOLOTYPE: NY; ISOTYPES: US 2167581 and 2167582, VEN 40651).

The holotype specimen has a number of flowers with bracteoles of different sizes, but all subtending the calyx inserted to nearly 2 mm below the calyx, as is typical of this form.

2. *CLITORIA JAVITENSIS* (HBK) Benth. var. *PORTOBELLENSIS* (Beurl.) Fantz, Ann. Mo. Bot. Gard. 67(3):589. 1980.

Clitoria portobellensis Beurl., Kongl. Vetenskaps Acad. Handl. p. 119. 1854.

Leaflets typically small, 7–18 cm long, 3–7 (9) cm wide. Petiole 4–10 (14) cm. Petiolule 4–6 (8) mm. Stipules 6–9 (10) mm. Inflorescences few-flowered, (0.5) 1–6 (8) cm. Pedicels 3–7 (9) mm. Bracts 4–6 mm. Bracteoles 4–7 mm, inserted 1–2 mm below the calyx base, subtending it. Stipe 24–32 mm.

TYPE: PANAMA. In silvis montium, Porto-Bello, Apr 1826, Billberg s.n. (LECTOTYPE: S-hb. Regnell!).

Beurling did not select a type specimen. He published the locality as "In silvis montium." The published name was *Clitoria (Vexillaria?) portobellensis* which agreed with the identification of the Billberg specimen deposited in a type folder at Stockholm. The specimen agrees with the published description. Based upon this evidence, the Billberg s.n. specimen (S) was selected as the lectotype because it was the probable specimen upon which Beurling described his new species.

2a. f. *portobellensis*

Leaves with pubescence on lower surface appressed, becoming glabrate, trichomes then confined to major nerves, more or less inconspicuous.

2b. f. *pilosa* Fantz, f. nov.

Forma nova C. javitensis var. portobellensis optimo distinguitur a foliis cum paginis infermis pilosi.

TYPE: PANAMA. CANAL ZONE: vic. of Gamboa, 20 Dec 1946, Allen 3931 (HOLOTYPE: G-Hb. Delessert; ISOTYPE: MO 1572352).

2c. f. *truncata* Fantz, f. nov.

Forma nova C. javitensis var. portobellensis optimo distinguitur a foliolo obovato cum apex truncato ad truncato-retusi. Foliola 5–8 cm longis, 4.5–5 cm latis, cuneati, infra glabratus, trichomata subappressus ad patenti secus nervalem. Forma rarior.

TYPE: PANAMA CANAL ZONE: Barro Colorado Island, Jan 1939, Brown 185 (HOLOTYPE: F 1004739).

3. *CLITORIA JAVITENSIS* (HBK) Benth. var. *longiloba* Fantz, *var. nov.*

Varietas nova *C. javitensis* optimo distinguitur a *lobis calycis elongatis*. Folia infra glabratus ad glabrous, trichomata subappressus parce secus nervalem; foliola 7–14 (19) cm longi, 4.5–9 (12) cm lati. Petioli 3–9 cm, rarior 9–10 cm cum grandifolia. Stipulae decidui, (4) 5–7 mm longi. Inflorescentiae pauciflorentes, 0.5–2 cm longi. Pedicelli 5–7 mm. Bracteae 3–4 mm. Bracteolae 3–4 (5) mm, calycis subtendus et inserta infra 1–2 mm. *Lobi calyces elongati, longitudo fere bis latitudo, apex brevius acuminus ad subulatus*, (5) 6–8 (9) mm longi. Stipites incogniti.

TYPE: PERU. LORETO: Stromgebeit de Marañón von Iquitos aufwärts bis zur Santiago-Mundang am Pongo de Manseriche, ca 77° 30' W, 1924, *Tessman* 3782 (HOLOTYPE: S; ISOTYPES: G-Hb. Delessert) Peru. San Antonio, Marañón, *Tessman* 3782 (PARATYPE: F 612407).

4. *CLITORIA JAVITENSIS* (HBK) Benth. var. *grandifolia* (Ducke) Fantz, *comb. nov.*

Clitoria grandifolia Ducke, Arch. Jard. Bot. Rio de Jan. 5: 141. 1930.

Leaflets typically grandifoliate, (10) 15–28 cm long, 6–15 cm wide. Petioles 10–25 cm. Petiolule 6–10 mm. Stipules 6–10 mm. Inflorescence elongate, 4–18 cm, multiflowered. Pedicels 5–9 (11) mm. Bracts 3–4 (5) mm. Bracteoles 4–6 mm. Calyx lobes (4) 5–8 mm, ventral lobe 7–12 mm. Stipe 19–24 mm.

TYPES: BRAZIL. AMAZONAS: Tonantins, 8 Nov 1927, *Ducke* 20399 (LECTOTYPE: RB-2 sheets.) Brazil. Sao Paulo de Olivenca, 18 Oct 1927, *Ducke* 20400 (LECTOPARATYPE: RB-2 sheets). Peru. Iquitos, 26 Feb 1924, *Kubmann* 1493 (LECTOPARATYPE: RB-2 sheets; ISOLECTOPARATYPE: U. *Non S = Canavalia dictyota*).

Ducke cited three collections he had examined from the herbarium at the Jardim Botânico de Rio de Janeiro. Each collection is mounted on two sheets placed in separate folders. Of these syntypes, *Ducke* 20400 lacked the fruits which were described in the original description of *C. grandifolia*, and *Kubmann* 1493 lacked any mature flowers. *Ducke* 20399 has a mature fruit, an inflorescence with many flowers, plus a packet of fruit fragments, one intact flower, and one dissected flower. As the best syntypic specimen which was examined by Ducke and which best matches the published description of *C. grandifolia*, *Ducke* 20399 was selected as the lectotype. The other two specimens cited by Ducke are designated as lectoparatypes.

REFERENCES

- BENTHAM, G. 1858. Synopsis of the genus *Clitoria*. Jour. Linn. Soc. 2: 33–44.
 FANTZ, P. R. 1979. Taxonomic notes and new sections of *Clitoria* subgenus *Bractearia* (Leguminosae). Sida, Contr. Bot. 8(1): 90–94.
 HUMBOLDT, F. H., A. BONPLAND and C. S. KUNTH. 1824. Nova genera et species plantarum quas in peregrinatione orbis novi collegerunt, descripserunt, partim adumbraverunt *Amatus Bonpland et Alexander de Humboldt*, ex schedis ex schedis autographis Amati Bonpland in ordinem digressit Carolus Siegmund Kunth. 6: 409–410. Paris.
 JOHNSTON, I. 1949. The botany of San José Island (Gulf of Panama). Sargentia 8: 148.

- SAGOT. 1882. Plantes de la Guyanne Francaise. Ann. Sci. Nat., Ser. 6.13: 299.
- SANDWITH, N. Y. 1931. New and noteworthy, Leguminosae and Rosaceae from British Guiana, XLVIII—Contributions to the flora of Tropical America: VII. Kew Bull. p. 357–358.